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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,506	06/06/2001	Matthew D. Giere	10006598-1	9309

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

NGUYEN, LAM S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/876,506	Applicant(s) GIERE ET AL.	
	Examiner LAM S NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40-44 and 46-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 40-44 and 46-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The indicated allowability of claims 41-42 is withdrawn in view of the newly discovered obviousness of Allen (US 4746935) in view of Maeda (US 6053599). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 40-43, 46, 49-62, 65-76, 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen (US 4746935) in view of Maeda (US 6053599).

Allen discloses a fluid ejecting printhead, comprising:

a substrate (FIG. 3A, element 30) having a surface;

a fluid/ink supply slot (FIG. 3A, element 32) formed through the substrate to the surface;

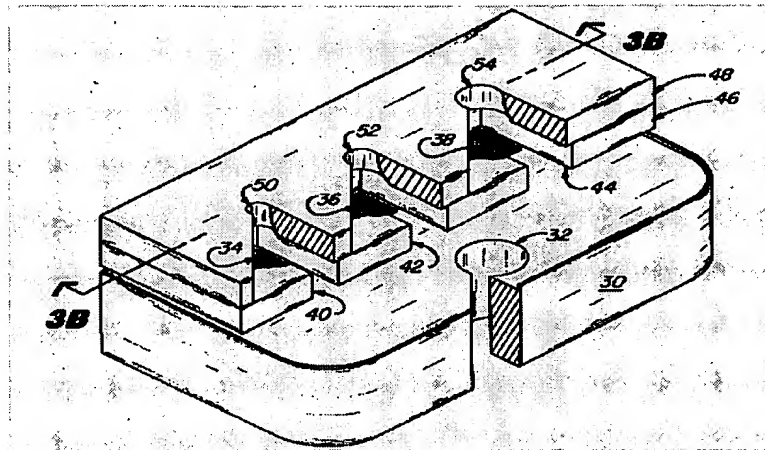
a thin film layer disposed on a surface of the substrate, the thin film layer defining a plurality of firing resistors (FIG. 3A, elements 34, 36, 38, 40, 42, 44 and column 4, lines 13-39);

a barrier/orifice structure (FIG. 3A, elements 46, 48) including a polymer layer (column 3, line 56-59), being supported by the substrate and defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers (FIG. 3A, elements 40,

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42, 44) in correspondence with correspondence with the array of nozzles (FIG. 3A, elements 50, 52, 54 and FIG. 5A-5B) (**Referring to claims 43, 73, 76**);

the firing resistors being arranged in correspondence with the firing chambers (FIG. 3A, elements 34, 36, 38);



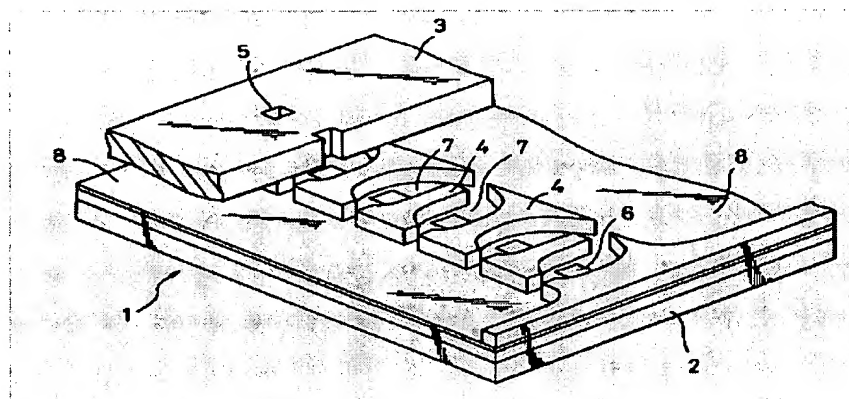
the barrier/orifice further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns to fluidically separate the first and second ones of the nozzle columns (FIG. 5A-5B: The orifice structure 82 includes a plurality of columns of nozzles (84, 86, 88), wherein each column nozzle is separated by a corresponding portion of the barrier layer to isolate different color inks provided to the column nozzles (**Referring to claim 78**);

wherein at least one ink feed slot/opening is arranged in a first group on a first side of said rib portion for feeding nozzles of the first one of said plurality of columns, and a second one on a second side of said rib portion for feeding nozzles of the second one of said plurality of columns (FIG. 3A and FIG. 5A-5B: There is at least one ink feed slot 32 to feed inks to a column of nozzles (84, 86, 88)) (**Referring to claim 79**);

a columnar group of drop generators (FIG. 5A, elements 84, 86, 88) formed on the surface that are arranged into subgroups each comprising at least two drop generators (FIG. 3B, 5A: a group of three different-size nozzles) (**Referring to claims 40, 46, 56**).

Allen does not disclose wherein each of said subgroups are supplied with fluid through a plurality of fluid supply slots/ink feed openings and being fluidically isolated from other subgroups on the surface and each subgroup includes a chamber and at least two firing resistors or a pair of drop generators, and comprising printhead electronics that provide firing pulses to the drop generators such that no two drop generators in the same subgroup are activated in sequence or simultaneously (**Referring to claims 40-42, 46, 49-50, 55-56, 61, 70-75**), an apparatus for imparting relative motion between the printhead substrate and a print media (**Referring to claims 57**).

Maeda discloses a liquid jet printhead relative moving to a print media (FIG. 31), wherein the printhead has nozzles/drop generators arranged into subgroups (FIG. 29: two elements 7),



wherein each subgroup comprises at least two nozzles/drop generators (FIG. 29: two elements 7), a chamber (FIG. 29, element 7), and at least two firing resistors (FIG. 29, element 6), is fed with liquid ink through a corresponding ink flow path isolated from other subgroup by the barrier

layer/orifice layer (FIG. 29: each group of two elements 7 is fluidically isolated from an other group by element 4), and two drop generators in the same subgroup are not driven in sequence or simultaneously (column 15, lines 15-25).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to use the concept of fluidically isolated feeding each nozzle/drop generator subgroup as disclosed by Maeda to modify the printhead disclosed by Allen such that drop generators in adjacent are subgrouped and each subgroup is fluidically isolated from other subgroups by a different fluid supply slot. The motivation of doing so is to avoid crosstalk in order to be capable of constantly maintaining good stable ink ejection conditions to obtain high quality images as taught by Maeda (column 3, line 34-38).

Allen also discloses the following claimed invention:

Referring to claims 52-53, 58-60, 66-68: further including a replaceable fluid/ink supply fluidically coupled to the fluid feed slot to supply the feed slot with fluid/liquid ink (FIG. 3A, 5A-5B: Each ink supply source 74, 76, 78 provides a different color ink to an ink slot 32).

Referring to claims 40, 51, 54, 62, 69: wherein the substrate includes a thin film layer that overlays the fluid feed slot, the thin film layer having openings that couple each of the subgroups to the fluid feed slot, wherein the thin film layer comprises a plurality of thin films, the thin film layer forming heater resistors in each of the drop generators (FIG. 3A, elements 34, 36, 38, 40, 42, 44 and column 4, lines 13-39).

2. Claims 44, 47-48, 63-64, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen (US 4746935) in view of Maeda (US 6053599), as applied to claims 46 and 73, and further in view of Steinfield et al. (US 5984464).

Allen, as modified, discloses the claimed invention as discussed above except wherein the printhead electronics activates the drop generators in said columnar group of drop generators one at a time, wherein the columnar group of drop generators is a primitive, and the substrate comprises a plurality of primitives arranged in a column, wherein the nozzles of each nozzle column have a pitch of 600 nozzles per inch (npi).

Steinfeld et al. disclose an ink jet printhead including a compact substrate of increased stability and structural integrity to provide a high resolution 600 dot-per-inch nozzle array (Abstract), wherein the associating firing chambers of the nozzles are grouped in a plurality of primitives arranged in columns (FIG. 14), and wherein only one firing chamber in the primitive is activated at a time (column 5, lines 20-27).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printhead disclosed by Allen, as modified, such that arranging the nozzles/drop generators in a plurality of primitives in which only one nozzle/drop generator is activated at a time as disclosed by Steinfeld et al. The motivation of doing so is to reduce the number of interco components needed to electrically connect the printhead to the printer unit in order to improve production and operating efficiency as taught by Steinfeld et al. (column 3, lines 7-11).

Response to Arguments

Applicant's arguments with respect to claims 40, 46, 56, 65, 73, 78 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151.

The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
July 11, 2004



HAI PHAM
PRIMARY EXAMINER